REMARKS/ARGUMENTS

Formal drawings are transmitted herewith under separate letter.

Claims 1-14, 16-20, 34, 38-46, 53, 55, 56, 58 stand cancelled.

Claims 15, 21, 22, 25, 28, 29, 35, 37, 47, 49, 54, 57 have been amended.

The amendment leaves claims 15, 21-33, 35-37, 47-52, 54, 57, 59-63 pending.

Claims 15, 21-33, 35-37, 47-52, 54, 57, 59-63 have been rejected under 35 U.S.C. §103(a) over Keyes EP 0261929 in view of McGowan, Jr. U.S. Patent 5,749,203. The references and the Examiner's comments in applying same have been carefully considered. The above amendment is believed to place this application in condition for allowance, and consideration in view of the following remarks is respectfully requested.

Keyes EP '929 shows containers in the form of trays 1 on conveyor 4 fed to thermo-forming station 5 and receiving film 6 from reel 7, column 4, lines 51-58. The trays are then passed to a loading station 10 where they are filled with food product 11 and closed by lidding material 12 in the form of a web of medical paper, column 5, lines 2-5. The two webs are then combined in a heat-sealing machine 16 using a shaped supporting tool 17 and an overhead sealing plate 18, column 5, lines 9-12. The packages 20, Fig. 1, are then fed on conveyor 21 to autoclave 22, Fig. 2 where they are stacked on supports 23 and subjected to a steam sterilization treatment, column 5, lines 22-25. After cooling, the packages are stacked in a drying tower 25, whereafter they are passed by conveyer 28 to a second heat-sealing machine 29 which closes the packages with upper web barrier film 30. In an alternative embodiment, column 5, lines 56+, the packages 20 leaving the heat-sealing machine of Fig. 1 are passed from the plant shown in Fig. 1 to pasteurization in the part of the plant shown in Fig. 3. In Fig. 3, the packages 20 are fed on conveyer 21 to a microwave or radio frequency tunnel 40 where they are

heated in a dielectric field between an electrode 41 connected to a microwave or radio frequency source 42 and a grounded electrode 43, column 5, line 62 through the top of column 6. As a result of the heating in tunnel 40, steam is generated in the packages 20 and the pressure of the steam may cause the lidding of medical paper to form a dome over each package, column 6, lines 2-6. Steam escapes through the dome, but the lidding material and the temperature of heating are chosen so as to ensure that the generation of steam does not rupture the package or the seal and that the contents of the package reach a temperature of from 65 to 100° C to ensure that the contents of the package are properly pasteurized, column 6, lines 6-13.

McGowan, Jr. '203 discloses a sterilization method including in a form-fill-and seal machine 14. In Fig. 4A, sealing station 410 includes upper lid or chamber 418 with a continuous lip 422 for engaging upper web 416, and a vertically adjustable seal die 424. A retractable gas nozzle 446 has a port 448 and is positioned between the top and bottom webs 416 and 412, column 9, lines 61-64. As noted at column 10, lines 24+, seal die 424 moves upwardly and creates three separate chambers within sealing station 410, namely A, B and C, Fig. 4B. The gas introduction sequence is illustrated in Fig. 4D, column 10, lines 48+, wherein gasses are introduced into chamber B via port 448. Fig. 4E illustrates the sealing sequence, column 11, lines 34+, wherein the top and bottom webs 416 and 412 are secured together, such as by bonding or fusing. Finally, as noted at column 11, lines 54+, the closed housing 417 is advanced by the conveyer system to the casing/palletizing station for degassing. A suitable housing may be formed by a top web 416 and a bottom web 412 for use in a form-fill-and seal process, Col. 3, lines 28-30, with the web forming material sufficiently permeable to the sterilizing gas while at the same time being sufficiently impermeable to contaminants, Col. 3, lines 30-32, permitting a sufficient amount of sterilizing gas within a reasonable period to de-gas or defuse through the web forming material to the exterior of the housing.

In McGowan, Jr. '203, a ported nozzle 446 is positioned between the top and bottom webs for selective movement of gases into and out of the housing, Col. 3, lines 43-45. Upon removal of the ported nozzle, the contacting portions of the top and bottom webs are

sealed together, Col. 4, lines 6-8, and the closed housing is then conveyed to a degassing area, Col. 4, line 17, for sufficient degassing time, e.g. at least about four hours as noted at Col. 4, line 20, Col. 5, line 4, and as shown in Tables I through IX, Cols. 14-22. In the noted Tables, the degassing time ranges from 2 hours to 24 hours. At sealing station 410, lid 418 has a gas port 420, and vertically adjustable seal die 424 has a gas port 428. Sealing station 410 further includes the noted retractable gas nozzle 446 having a port 448 and positioned between the top and bottom webs 416 and 412, Col. 9, lines 61-64. Initially, the top and bottom webs 416 and 412 are in loose contact, and nozzle 446 is inserted between the top and bottom webs 416 and 412, Col. 10, lines 3-6. Elevation of seal die 424 contacts and compresses portions of the top and bottom webs 416 and 412 against each other to create a seal and also captures the tip portion of the gas nozzle 446 between the top and bottom webs, Col. 10, lines 11-13. The webs 416 and 412 are in compressive contact but are not secured or fused together, and the port 448 provides a means for the selective movement of gases into and out of the housing 417, Col. 10, lines 18-22.

In McGowan, Jr. '203, three separate chambers are created, namely A, B, C, Fig. 4B, Col. 10, lines 24+. Chamber A is defined by the interior area of the lid 418 and the upper surface of the top web 416 and gas port 420 communicates gases into and out of chamber A, Col. 10, lines 27-31. Chamber B is defined by the interior of the housing 417, and port 448 communicates gases into and out of chamber B via nozzle 446, Col. 10, lines 31-34. Chamber C is defined by the interior area of the seal die 424 and the lower surface of the bottom web 412, and port 428 provides selective movement of gases into and out of chamber C, Col. 10, lines 34-37. Fig. 4D illustrates the gas introduction sequence, Col. 10, lines 48+. The vacuum is removed from chambers A and C which are ventilated via gas ports 420 and 428, respectively, Col. 10, lines 48-50. During the ventilation of chambers A and C, or shortly thereafter, gases are introduced into chamber B via port 448, Col. 10, lines 51-52. Fig 4E illustrates the sealing sequence, Col. 11, lines 34+. In this sequence, the supply of gases to the nozzle 446 is removed. The top and bottom webs 416 and 412 are secured together such as by bonding or fusing, thus closing housing 417.

Claim 15

Amended claim 15 requires applying the pasteurizing medium to the surface of the food product with directional jets, and directing the pasteurizing medium at high velocity to physically displace the food product and apply the pasteurizing medium to the entire outer surface of the food product. This is supported in the specification at page 7, lines 30+, noting that in preferred form, high velocity steam is applied from the jets to physically displace food product P and lift same slightly upwardly from package surface 342 by a small gap 402, to apply steam to the entire outer surface of food product P. Applicant has carefully reviewed the references, but fails to find any teaching or even suggestion of this method step. Furthermore, there is no disclosure in the references of how to combine same to accomplish such method step absent applicant's disclosure. Consideration and allowance of claim 15 is earnestly solicited.

Claim 21

Amended claim 21 requires directing the pasteurizing medium at the food product at high velocity to physically displace the food product from the package and apply the pasteurizing medium to the entire outer surface of the food product. Consideration and allowance of claim 21 for the reasons noted above is respectfully requested.

Claim 22

Amended claim 22 requires that the chamber have first and second distal ends, and further requires flowing the pasteurizing medium across the food product by introducing the pasteurizing medium at the first distal and venting the pasteurizing medium at the second distal end. In contrast in McGowan, Jr. '203, the steam and/or sterilization gas for article 414 is introduced only at port 448 and is vented only at the same port 448, Col. 10, line 21. Consideration and allowance of claim 22 is respectfully requested.

Claims 23, 24

Claim 23 depends from claim 22 and is believed allowable for the reasons noted above. Furthermore, claim 23 requires cyclically and alternately reversing the supply and

venting of the pasteurizing medium at the first and second distal ends to provide alternating direction flow of pasteurizing medium across the food product and provide a pulsing effect of the flow. The references do not teach or suggest the noted alternate reversal and alternating direction of flow providing a pulsing effect. It is respectfully noted that there has been no prima facie showing supporting rejection of this claimed method step, even if the references are combined. In accordance with MPEP 2144.03, applicant respectfully but vigorously traverses this rejection. MPEP 2144.03 indicates "the rationale supporting an obviousness rejection may be based on common knowledge in the art or 'well-known' prior art" and "the Examiner may take official notice of facts outside of the record which are capable of instant and unquestionable demonstration as being 'well-known' in the art" and "if justified, the Examiner should not be obliged to spend time to produce documentary proof" and "if the knowledge is of such notorious character that official notice can be taken, it is sufficient so to state". However, MPEP 2144.03 also notes, second paragraph, last sentence, "if the applicant traverses such an assertion the Examiner should cite a reference in support of his or her position". Applicant hereby respectfully traverses such assertion by the Examiner, and respectfully requests citation of a reference in support of the Examiner's position. Absent such supporting evidence, it is respectfully submitted that a prima facie case has not been made.

Claim 24 depends from claim 22 and is believed allowable for the reasons noted above. Furthermore, claim 24 requires venting both steam and condensate from the chamber, which is not taught in the art.

Claim 25

Amended claim 25 requires providing the pasteurization station with first, second and third ports, and providing a first flush mode introducing pasteurizing medium at the first port and venting the pasteurizing medium at at least one of the second and third ports, providing a second flush mode introducing pasteurizing medium at the second port and venting the pasteurizing medium at at least one of the first and third ports, and providing a third flush mode introducing pasteurizing medium at both of the first and second ports and venting the

pasteurizing medium at the third port. This three-port, three flush mode methodology is nowhere taught nor even remotely suggested in the references. This embodiment is supported in the specification beginning at page 8, lines 27+.

Claims 26, 27

Claim 26 depends from claim 25 and is believed allowable for the reasons noted above. Furthermore, claim 26 requires providing the third port between the first and second ports, and during the first flush mode, flowing the pasteurizing medium in a first direction across the food product, and during the second flush mode, flowing the pasteurizing medium across the food product in a second direction opposite to the first direction, and during the third flush mode, flowing the pasteurizing medium in each of the noted first and second directions to the noted third port. This combination is not taught in the references.

Claim 27 depends from claim 25 and is believed allowable for the reasons noted above. Furthermore, claim 27 requires providing the third port between the first and second ports, and during the first flush mode, flowing the pasteurizing medium in a first direction across the food product, and during the second flush mode, flowing the pasteurizing medium across the food product in a second direction opposite to the first direction, and during the third flush mode, flowing the pasteurizing medium in each of the first and second directions from the noted third port. This is not taught in the references.

Claim 28

Amended claim 28 requires providing the pasteurization station with a chamber having first, second and third ports, the third port being between the first and second ports, and providing a flush mode introducing pasteurizing medium at the third port and venting the pasteurizing medium at at least one of the first and second ports. There is no teaching in the references of this three-port flushing mode and venting mode combination. Consideration and allowance of claim 28 is respectfully requested.

Claim 29

Amended claim 29 requires that the food product be one or more hot dogs each extending longitudinally between first and second wrinkled ends, and requires introducing pasteurizing medium at the pasteurization station to each of the first and second wrinkled ends, and flowing the pasteurizing medium longitudinally along the hot dog. There is no teaching in the references of introducing the pasteurizing medium to each of first and second wrinkled ends of a hot dog, nor is there any teaching of flowing the pasteurizing medium longitudinally along the hot dog. There is no prima facie evidence supporting rejection, and applicant respectfully but vigorously traverses such rejection, and notes the above MPEP 2144.03.

Claims 30-33

Claim 30 depends from claim 29 and is believed allowable for the reasons noted above. Furthermore, claim 30 requires initially introducing the pasteurizing medium to each of the first and second wrinkled ends and then flowing the pasteurizing medium longitudinally along the hot dog. This introduction of pasteurizing medium to each of the first and second wrinkled ends and then flowing the pasteurizing medium longitudinally along the hot dog is nowhere taught nor suggested in the references.

Claim 31 depends from claim 29 and is believed allowable for the reasons noted above. Furthermore, claim 31 requires initially flowing the pasteurizing medium longitudinally along the hot dog and then to the first and second wrinkled ends. This introduction of pasteurizing medium longitudinally along the hot dog and then to the first and second wrinkled ends is nowhere taught nor suggested in the references.

Claim 32 depends from claim 29 and is believed allowable for the reasons noted above. Furthermore, claim 32 requires introducing the pasteurizing medium alternately at the first and second wrinkled ends. This alternate introduction of pasteurizing medium at the first and second wrinkled ends is nowhere taught nor suggested in the references.

Claim 33 depends from claim 29 and is believed allowable for the reasons noted above. Furthermore, claim 33 requires introducing the pasteurizing medium simultaneously at the first and second wrinkled ends. This simultaneous introduction of the pasteurizing medium at the first and second wrinkled ends is nowhere taught nor suggested in the references.

It is further respectfully submitted that the various alternate embodiments such as set forth in claims 30-33 are not citable against each other to support a basis for rejection because they are provided by applicant's disclosure and would require hindsight to reject one over the other or otherwise combine same, which hindsight supported rejection is impermissible.

Claim 35

Amended claim 35 requires that the pasteurization station include a pressure vessel chamber, and requires introducing pressurized pasteurizing medium into the chamber to pasteurize the food product, and processing the food product at the pasteurization station by closing the chamber, introducing pressurized pasteurizing medium into the chamber to pasteurize the food product, and venting the pasteurizing medium from the chamber and depressurizing and opening the chamber. In contrast, chamber 417 in McGowan, Jr. '203 is not opened after the pasteurization, nor is Keyes EP '929. Consideration and allowance of claim 35 is respectfully requested.

Claim 36

Claim 36 depends from claim 35 and is believed allowable for the reasons noted above. Furthermore, claim 36 requires opening the chamber prior to complete depressurization thereof such that the chamber is opened while some residual pressure still remains in the chamber, thereby decreasing cycle time to increase throughput rate. This is not taught in the references.

Claim 37

Amended claim 37 requires pasteurizing the food product with steam which condenses on the food product to condensate, and immediately after pasteurization with the steam, removing excess moisture from the food product with high velocity sterile air prior to closing of the package at the closing station. This is supported in the specification at page 10, lines 1+. This method step is not taught in the references. Consideration and allowance of claim 37 is respectfully requested.

Claims 47, 48

As noted in the specification, beginning at page 7, lines 11+, in preferred form, the surface of the food product is pasteurized at the pasteurization station by condensing steam on the food product surface in dropwise condensation and retarding onset of film condensation by removing condensate film from the surface. In this method, it is preferred that the condensate film be removed as soon as it forms on the food product surface, such that condensation is substantially only dropwise condensation and not film condensation.

In the fluid dynamics of heat transfer, as is known, there are two different regimes of condensation of steam on cold surfaces. When a cold surface is initially exposed to steam, there is an extremely high heat transfer rate during a phase called dropwise condensation. As the condensing process continues, a film of condensate forms over the entire surface, and the heat transfer rate is slowed, with the film of condensed water acting as an insulator. Most steam heat transfer processes are based on the film-type condensation since it is the mode of heat transfer that can be readily maintained over time. Film-type condensation does have a high heat-transfer rate, but dropwise condensation rates can be a full order of magnitude higher.

The method of the preferred embodiment of the present invention uses the higher heat transfer rate of dropwise condensation. The condensate film is removed from the surface of food product P as soon it forms on such surface by removing the film.

Amended claim 47 requires retarding the onset of film condensation by removing condensate film from the surface of the food product. This is not taught in the references absent applicant's disclosure. Consideration and allowance of claim 47 is respectfully requested.

The Examiner states on page 4 of the Office Action, first paragraph, that Keyes discloses removing condensate film from the surface by using an ultraviolet light, Col. 4, lines 15+. In response and rebuttal, it is respectfully noted that Keyes EP '929 indicates that "the packages may be finally subjected to an irradiation sterilization, preferably by use of ultra-violet light", Col. 4, lines 18-19. Thus, the ultraviolet light is used for irradiation sterilization in Keyes. There is no teaching nor disclosure of removing condensate film.

Claim 48 depends from claim 47 and is believed allowable for the reasons noted above. Furthermore, claim 48 requires condensing steam on the surface in dropwise condensation, and removing the condensate film as soon as it forms on the surface, such that condensation is substantially only dropwise condensation and not film condensation. This is not taught in references absent applicant's disclosure. Consideration and allowance of claim 48 is respectfully requested.

Claim 49

Amended claim 49 requires removing condensate film from the food product with directional jets. This is not taught in the references, absent applicant's disclosure, and absent a prima facie showing in accordance with MPEP 2144.03. Consideration and allowance of claim 49 is respectfully requested.

Claims 50-52

Claim 50 depends from claim 49 and is believed allowable for the reasons noted above. Furthermore, claim 50 requires applying high velocity steam from jets physically displacing the food product and applying steam to the entire outer surface of the food product.

This is not taught in the references, and is believed allowable including for the reasons noted above.

Claim 51 depends from claim 50 and is believed allowable for the reasons noted above. Further, claim 51 requires that the stations include a loading station loading the food product in a package prior to the pasteurization station, and physically displacing and lifting the food product from the package at the pasteurization station with high velocity steam from the jets to enable application of steam to the entire outer surface of the food product. This is not taught in the references.

Claim 52 depends from claim 50 and is believed allowable for the reasons noted above. Furthermore, claim 52 requires that the stations include a loading station loading the food product in a package prior to the pasteurization station, and further requires inducing movement of the food product in the chamber at the pasteurization station with high velocity steam from the jets to enable an application of steam to the entire outer surface of the food product. This is not taught in the references.

Claim 54

Amended claim 54 requires that the food product include longitudinally extending members, and that the package be supported on a surface having ridges extending transversely to the longitudinally extending tubular members to minimize surface area contact therewith and maximize exposure of the longitudinally extending tubular members to the steam.

Claim 57

Amended claim 57 requires that the food product be a non-encased food product, and further requires pasteurizing the non-encased food product in a pressurized chamber by introducing the pasteurizing medium into the chamber and venting the pasteurizing medium from the chamber at a slower outflow rate than the inflow rate of the pasteurizing medium into the chamber such that pressure in the chamber increases, to increase the temperature of the

pasteurizing medium to an effective temperature for killing bacteria. This combination is believed allowable.

Claims 59-63

Claim 59 depends from claim 57 and is believed allowable for the reasons noted above. Furthermore, claim 59 requires providing first and second ports into the chamber, providing a first cycle and inflowing the pasteurizing medium into the chamber through the first port and venting the pasteurizing medium from the chamber through the second port at a slower outflow rate than the inflow rate through the first port in the noted first cycle, and providing a second cycle and inflowing the pasteurizing medium into the chamber through the second port and venting the pasteurizing medium from the chamber through the first port at a slower outflow rate than the inflow rate of the pasteurizing medium into the chamber through the second port in the noted second cycle, such that pressure builds in the chamber in each of the first and second cycles. In contrast, in McGowan, Jr. '203, inflow and outflow is through the same port 448, Col. 10, lines 20-22.

Claim 60 depends from claim 57, and is believed allowable for the reasons noted above. Furthermore, claim 60 requires providing first and second ports into the chamber, and providing a pasteurization cycle continuously flowing the pasteurizing medium into the chamber through the first port and continuously venting the pasteurizing medium from the chamber through the second port to provide continuous flow of the pasteurizing medium across the food product during the pasteurization cycle without sealing the chamber against outflow or otherwise blocking venting of the pasteurizing medium from the chamber during the pasteurization cycle. This is not taught in the references.

Claim 61 depends from claim 60 and is believed allowable for the reasons noted above. Furthermore, claim 61 requires that the pasteurizing medium be steam, and further requires that the continuous flow strips away steam film condensate from the food product, enhancing heat transfer.

Claim 62 depends from claim 57 and is believed allowable for the reasons noted above. Furthermore, claim 62 requires supplying the pasteurizing medium to the chamber during a pasteurization cycle, and immediately after the pasteurization cycle, providing a vacuum cooling step removing the pasteurizing medium from the chamber and vacuum cooling the food product by evaporative cooling, namely by evaporation of condensate. This combination is not taught in the references.

Claim 63 depends from claim 57 and is believed allowable for the reasons noted above. Furthermore, claim 63 requires surface pasteurizing the food product with dual chamber heat treatment comprising providing a first pressurized chamber and pasteurizing the food product with condensing steam therein, and transferring the food product to a second pressurized chamber and pasteurizing the food product with superheated steam in the pressurized second chamber. This is not taught in the references.

It is believed that this application is in condition for allowance with claims 15, 21-33, 35-37, 47-52, 54, 57, 59-63, and such action is earnestly solicited.

Respectfully submitted,

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